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APPLICATION NO.	FILING DATE	FIRST NAMED INVENTOR	ATTORNEY DOCKET NO.	CONFIRMATION NO.
09/445,423	12/10/1999	KAZUO HATA	2839-0072-0	9913

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EXAMINER	
FERGUSON, LAWRENCE D	30

ART UNIT	PAPER NUMBER
1774	

DATE MAILED: 10/20/2003

Please find below and/or attached an Office communication concerning this application or proceeding.

Office Action Summary	Application No.	Applicant(s)	
	09/445,423	HATA ET AL.	
	Examiner	Art Unit	
	Lawrence D Ferguson	1774	

-- The MAILING DATE of this communication appears on the c ver sheet with the correspondence address --

Period for Reply

A SHORTENED STATUTORY PERIOD FOR REPLY IS SET TO EXPIRE 3 MONTH(S) FROM THE MAILING DATE OF THIS COMMUNICATION.

- Extensions of time may be available under the provisions of 37 CFR 1.136(a). In no event, however, may a reply be timely filed after SIX (6) MONTHS from the mailing date of this communication.
- If the period for reply specified above is less than thirty (30) days, a reply within the statutory minimum of thirty (30) days will be considered timely.
- If NO period for reply is specified above, the maximum statutory period will apply and will expire SIX (6) MONTHS from the mailing date of this communication.
- Failure to reply within the set or extended period for reply will, by statute, cause the application to become ABANDONED (35 U.S.C. § 133).
- Any reply received by the Office later than three months after the mailing date of this communication, even if timely filed, may reduce any earned patent term adjustment. See 37 CFR 1.704(b).

Status

1)☒ Responsive to communication(s) filed on *22 July 2003* .

2a)☐ This action is **FINAL**. 2b)☒ This action is non-final.

3)☐ Since this application is in condition for allowance except for formal matters, prosecution as to the merits is closed in accordance with the practice under *Ex parte Quayle*, 1935 C.D. 11, 453 O.G. 213.

Disposition of Claims

4)☒ Claim(s) *1-13* is/are pending in the application.

4a) Of the above claim(s) _____ is/are withdrawn from consideration.

5)☐ Claim(s) _____ is/are allowed.

6)☒ Claim(s) *1-13* is/are rejected.

7)☐ Claim(s) _____ is/are objected to.

8)☐ Claim(s) _____ are subject to restriction and/or election requirement.

Application Papers

9)☐ The specification is objected to by the Examiner.

10)☐ The drawing(s) filed on _____ is/are: a)☐ accepted or b)☐ objected to by the Examiner.

Applicant may not request that any objection to the drawing(s) be held in abeyance. See 37 CFR 1.85(a).

11)☐ The proposed drawing correction filed on _____ is: a)☐ approved b)☐ disapproved by the Examiner.

If approved, corrected drawings are required in reply to this Office action.

12)☐ The oath or declaration is objected to by the Examiner.

Priority under 35 U.S.C. §§ 119 and 120

13)☐ Acknowledgment is made of a claim for foreign priority under 35 U.S.C. § 119(a)-(d) or (f).

a)☐ All b)☐ Some * c)☐ None of:

1.☐ Certified copies of the priority documents have been received.

2.☐ Certified copies of the priority documents have been received in Application No. _____ .

3.☐ Copies of the certified copies of the priority documents have been received in this National Stage application from the International Bureau (PCT Rule 17.2(a)).

* See the attached detailed Office action for a list of the certified copies not received.

14)☐ Acknowledgment is made of a claim for domestic priority under 35 U.S.C. § 119(e) (to a provisional application).

a) ☐ The translation of the foreign language provisional application has been received.

15)☐ Acknowledgment is made of a claim for domestic priority under 35 U.S.C. §§ 120 and/or 121.

Attachment(s)

1) ☐ Notice of References Cited (PTO-892)
2) ☐ Notice of Draftsperson's Patent Drawing Review (PTO-948)
3) ☐ Information Disclosure Statement(s) (PTO-1449) Paper No(s) _____ .
4) ☐ Interview Summary (PTO-413) Paper No(s). _____ .
5) ☐ Notice of Informal Patent Application (PTO-152)
6) ☐ Other: .

DETAILED ACTION

Response to Amendment

1. This action is in response to the amendment mailed July 22, 2003.

Claim 1 was amended rendering claims 1-13 pending.

Claim Rejections – 35 USC 103(a)

2. The following is a quotation of 35 U.S.C. 103(a) which forms the basis for all obviousness rejections set forth in this Office action:

> (a) A patent may not be obtained though the invention is not identically disclosed or described as set forth in section 102 of this title, if the differences between the subject matter sought to be patented and the prior art are such that the subject matter as a whole would have been obvious at the time the invention was made to a person having ordinary skill in the art to which said subject matter pertains. Patentability shall not be negatived by the manner in which the invention was made.

3. Claims 1, 3, 5-7 and 9-12 are rejected under 35 U.S.C. 103(a) as being unpatentable over Osaka et al. (U.S. 5,057,360).

4. Osaka discloses a ceramic composition comprising 100 parts by weight of at least one fine ceramic powder selected from the group consisting of zirconia having an average particle diameter in the range of 0.01 to 2 microns (abstract, lines 1-5) along with a green sheet with a fracture or crack (column 1, lines 26-27) and solid electrolyte fuel cells (column 3, lines 23-24). The reference discloses at least one species of fine ceramic powder consisting of zirconia having an average particle diameter in the range of 0.01 to 2 microns and the individual particles of the ceramic powder as the raw material have a homaxially spherical shape (column 3, lines 37-51) where the zirconia

powder is mixed with yttrium (column 3, lines 60-64). Osaka discloses minute spherical zirconia having particle diameter whose standard deviation is in the range of 1 to 1.5 (column 5, lines 17-20) and a fixed gap and subsequently heating and drying continuously at a fixed temperature range of 40°C to 150°C to produce the ceramic green sheet (column 7, lines 62-65). The ceramic sheet is obtained by calcining the green sheet at a temperature in the range of 200°C to 500°C (column 8, lines 26-36) and by heating at the specified temperature the green sheet is sandwiched and baked within the ceramic material, which can be considered a sintering temperature because it heated the material without melting the material. Osaka discloses very small spherical particles of zirconia having an average diameter of 0.5 micron (column 9, lines 61-62) and an amount of warp in the range of 0.007mm to 0.023mm (column 14, lines 5-15) where the warp is analogous to a flaw. Osaka does not disclose the defects being detected based on an image obtained with a charge coupled device. An image obtained with a charged coupled device is an experimental procedure and is not considered to be part to the claimed product, which is a ceramic sheet. Although Osaka does not specifically mention that the sheet has fewer than 5 defects, only the warp is mentioned. Therefore it would have been obvious to one of ordinary skill in the art to make the ceramic green sheet as claimed because Osaka teaches only 1 defect.

Although Osaka does not specifically disclose the spherical particles ratio, the spherical particle ratio is optimizable and directly affects the density of the green sheet. It would have been obvious to one of ordinary skill in the art to optimize the components

because discovering the optimum or workable ranges involves only routine skill in the art. See *In re Boesch*, 617 USPQ 215 (CCPA 1980).

Claim Rejections – 35 USC 103(a)

5. Claims 1-10 and 13 are rejected under 35 U.S.C. 103(a) as being unpatentable over Kazuo et al. (JP 8151270).

6. Kazuo discloses an average particle size of .1-0.5μm (abstract, line 6) along with a firing temperature placed on the green sheet and firing to give the ceramic sheet more than 400cm area, less than 0.4mm thickness and less than 0.1% warpage (abstract, lines 7-11). The firing of the sheets is considered to be baking at a sintered temperature because no melting of parts is observed. Figures 1-3 depict a sandwiching of the various parts of the invention. Kazuo discloses a ceramic sheet with 10% cracks or less (column 1, lines 1-19) where a ceramic sheet composed of zirconia (column 1, lines 20-21) and yittria (column 1, lines 22-25) where Kazuo uses the ceramic sheet for an electrolyte film for a battery (column 1, lines 26-27). The reference discloses the average diameter of the original material is 0.1-0.5 μm (column 1, lines 30-33) and a ceramic sheet with a centered ceramic green sheet and centered porous sheet having a density of 30-85% (column 1, lines 36-49). Kazuo does not disclose the defects detected are less than five based on an image obtained with a charge coupled device. No more than 1 defect is mentioned. An image obtained with a charged coupled device is an experimental procedure and is not considered to be part to the claimed product, which is a ceramic sheet. Further the reference does not disclose any foreign matter,

flaw or scratch or stain. Therefore the ceramic sheet of Kazuo is considered to be free from no more than five defects as instantly claimed. Kazuo does not disclose spherical particles. It would have been obvious to one of ordinary skill to make the particles spherical, since such a modification would have involved a mere change in shape of a component. A change in shape is generally recognized as being within the level of ordinary skill in the art.

Claim Rejections – 35 USC 103(a)

7. Claims 1-10 are rejected under 35 U.S.C. 103(a) as being unpatentable over Kazuo et al. (JP 8151271).

8. Kazuo discloses a ceramic sheet obtained by placing the green sheet on or between porous sheets (abstract, lines 4-8) and firing the green sheet to the ceramic sheet (abstract, lines 9-11). The firing of the sheets is considered to be baking at a sintered temperature because no melting of parts is observed. Figures 1-3 depict a sandwiching of the various parts of the invention. The reference discloses a ceramic sheet having an area of more than 600 cm^2 and thickness of 1mm or less (column 1, lines 1-4) having a maximum warping of 100μm or less and 0.1% or less warpage (column 1, lines (5-7). Kazuo discloses the main component consisting of zirconia and a second composition consisting of yittria (column 1, lines 8-11) with a particle size of 0.1-0.5μm and a particle size of 1μm or less (column 1, lines 19-25). Kazuo does not disclose spherical particles. It would have been obvious to make the particles spherical,

since such a modification would have involved a mere change in shape of a component. A change in shape is generally recognized as being within the level of ordinary skill in the art. Kazuo discloses use for electrolyte film (column 1, lines 30-32) and a ceramic sheet with a centered ceramic green sheet and centered porous sheet having a density of 30-85% (column 1, lines 36-49). Kazuo does not disclose the defects being detected based on an image obtained with a charge coupled device. Kazuo discloses no stain, flaw of a scratch or foreign matter which means the ceramic sheet of Kazuo is free from no more than five defects as instantly claimed An image obtained with a charged coupled device having a sintering temperature is an experimental procedure and is not considered to be part to the claimed product, which is a ceramic sheet.
"Even though product-by-process claims are limited by and defined by the process, determination of patentability is based on the product itself. The patentability of a product does not depend on its method of production. If the product in the product-by-process claim is the same as or obvious from a product of the prior art, the claim is unpatentable even though the prior product was made by a different process." In re Thorpe, 777 F.2d 695, 698, 227 USPQ 964, 966

Response to Arguments

9. Rejection made under 35 USC 112, second paragraph is withdrawn due to Applicants amendment filed December 6, 2002.

Applicant's arguments to 35 USC 103(a) being unpatentable over Osaka et al. (U.S. 5,057,360) has been fully considered but is unpersuasive. Applicant amends to

define foreign matter as 'a substance other than a starting material used for producing the ceramic sheet' and a flaw as 'a scratch formed during production of the ceramic sheet.' Examiner would like to point to page 11 of the instant specification, in the second paragraph, which reads "as to the flaws formed on the ceramic sheet, there are various kinds of shapes, for example, line shaped flaws formed by scratching the ceramic sheet, chain shaped flaws, dot shaped flaws which look as if they are formed by pricking the ceramic sheet with a needle, round shaped flaws and pinholes." Further on page 9, the last paragraph of the instant application reads 'concave flaws' which is analogous to a warp. Applicant argues fractures and cracks are not foreign matter on a ceramic sheet. Examiner acknowledges and agrees with this argument due to the current amendment. Applicant argues by normalizing the warp over a 50 mm square portion of the ceramic sheet, Osaka implies the warp is over the entire ceramic sheet. This is not true because based on the normalized section of the sheet, the warp range was from 0.007mm to 0.023mm (column 14, lines 5-15) indicating the warp is present on a localized surface of the ceramic sheet and not the entire sheet.

Applicant's arguments to 35 USC 103(a) being unpatentable over Kazuo et al. (JP 8151270) and Kazuo et al. (JP 8151271) have been considered but are unpersuasive. Applicant argues that warpage and cracks are properties of a ceramic sheet and are not foreign matter on a ceramic sheet. Although warpage is not foreign matter, it is considered to be a defect. On page 11 of the instant specification, in the second paragraph, reads "as to the flaws formed on the ceramic sheet, there are various kinds of shapes, for example, line shaped flaws formed by scratching the

ceramic sheet, chain shaped flaws, dot shaped flaws which look as if they are formed by pricking the ceramic sheet with a needle, round shaped flaws and pinholes." Further on page 9, the last paragraph of the instant application reads 'concave flaws' which is equivalent to a warp. Regardless, Kazuo teaches a ceramic sheet not have more than five defects since Kazuo mentions none of these flaws.

Conclusion

10. Any inquiry concerning this communication or earlier communications from the examiner should be directed to Lawrence Ferguson whose telephone number is (703) 305-9978. The examiner can normally be reached on Monday through Friday 8:30 AM – 4:30PM. If attempts to reach the examiner by telephone are unsuccessful, the examiner's supervisor, Cynthia Kelly can be reached on (703) 308-0449. Please allow the examiner twenty-four hours to return your call.

The fax phone numbers for the organization where this application or proceeding is assigned are (703) 872-9310 for regular communications and (703) 872-9311 for After Final communications. Any inquiry of a general nature or relating to the status of this application or proceeding should be directed to the receptionist whose telephone number is (703) 308-2351.

Lawrence D. Ferguson
Examiner
Art Unit 1774

CYNTHIA H. KELLY
SUPERVISORY PATENT EXAMINER
TECHNOLOGY CENTER 1700